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Abandoned Automobile Removal

Kentucky Dept for Natural Resources and Environmental Protection

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Environmental Protection Agency, Washington, D C Office of Solid Waste Management Programs

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ABANDONED AUTOMOBILE REMOVAL

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16. Abstract

Kentucky has an estimated 300,000 abandoned automobiles that plague her with adverse health and environmental problems. This report gives a detailed study of two pilot projects, which helped to improve the market for abandoned vehicles, plus a full-scale demonstration project, which was to improve overall solid waste management by recovering, for recycling, as many junked and abandoned vehicles as possible in 15 selected counties. The benefits of the program were many. During the project year, over 3,000 abandoned vehicles were collected and recycled. Each car was converted into approximately one ton of steel. Local sponsors received about $100,000 from the sale of the junked cars to recycling firms. Therefore, aesthetic, environmental, and monetary goals were all met. Discussion of future program needs and legislative recommendations were also included in this report.

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SUMMARY

BACKGROUND

Abandoned automobiles have been a problem in Kentucky for many years. Eastern Kentucky has earned the name "Detroit's Graveyard" because of the vast number of abandoned vehicles in the area. Statewide it is estimated there are 300,000 junked and abandoned vehicles, many of which are rusted remnants.

"Recycling Solid Waste," a report prepared for the Kentucky Department for Human Resources, suggested several reasons for this phenomena:

- Some areas seem to attract "junk vehicles." A pattern develops. A family is not concerned about leaving an old car in its yard if neighbors on either side have old vehicles in their yards.
- A high percentage of the people in the areas containing a high density of abandoned vehicles are not overly concerned with the presence of vehicles. Many want the vehicle for various reasons, including the availability of spare parts.
- It costs time and money for the owner to move a junker from his/her property. Both are scarce for most of the people in the areas reflecting the greatest concentration of abandoned vehicles.

It is not unusual for an abandoned vehicle left along a road or in a field to become a focal point for area residents to begin a trash and garbage dump. These abandoned vehicles and associated dumps create unsightly blights on the landscape, add to environmental degradation and provide breeding and harborage areas for unwanted pests and diseases.

PROJECT DEVELOPMENT

The 1972 Kentucky General Assembly created the Department for Natural Resources and Environmental Protection and gave it several duties and functions, which prior to that time did not exist. In order to fill an administrative gap not covered by an existing program, the Division of Special Programs was created. One of the sub-units of this Division is the Beautification Section. This section is concerned primarily with cleaning up roadside areas that were being used for solid waste disposal, referred to as "orphan dumps."

Mr. E. Thomas Reed, Director of the Division of Special Programs, developed a keen interest in abandoned vehicle removal in rural areas. Mr. Reed was able to convince Governor Wendell Ford of the feasibility of undertaking a pilot project in two (2) counties: Hardin County in Western Kentucky and Clark County in Eastern Kentucky.

Since the Division had neither the personnel nor equipment to recover or retrieve abandoned vehicles, the Fort Knox Military Installation furnished the necessary manpower and equipment for

the project in Hardin County. A local environmental organization coordinated the project and was the beneficiary of revenues received from the sale of the vehicles to a scrap metal company. Approximately 600 vehicles were collected with a revenue of about $9,000 received from sales.

In Clark County, local businesses with access to automobile wreckers were asked to participate in the project. They received $5.00 from the County Fiscal Court for each abandoned vehicle retrieved. The Jaycees were responsible for locating the junked vehicles and obtaining the legal release from the owner or individuals on whose land the vehicle rested. Approximately 200 vehicles were collected with a revenue of about $3,400 received from sales by the Jaycees.

In both pilot projects the vehicles were sold to scrap metal firms for approximately $8.00 to $10.00 each. The market for abandoned vehicles has improved markedly since this pilot project began in 1973. Through the summer of 1973, the Kentucky Department of Transportation and the Division of Forestry within the Department for Natural Resources and Environmental Protection furnished personnel and equipment used in the vehicle retrieval program. This arrangement, however, was abandoned for several reasons: (1) During the fall fire season the Division of Forestry had to keep its personnel and equipment in a state of preparedness; and (2) Crews from the Department of Transportation were not allowed to remove vehicles that were not on a publicly owned highway right-of-way. The Division of Special Programs, however,

was able to continue the project through the winter of 1973-74 using its own personnel and two (2) trucks made available from the Tennessee Valley Authority.

It was apparent that the success of an expanded program would depend upon the Department for Natural Resources and Environmental Protection being able to provide personnel, equipment and technical assistance on a continuing basis.

Several lessons were learned from these two pilot projects. It was determined that in the future only non-profit and non-governmental groups would be used as county sponsors. This aspect of the program is its most innovative feature and is primarily responsible for its success. Persuading citizens to give their vehicles to the state is a difficult task; however, when a citizen is approached by a scout, high school band member, or a local Jaycee who explains the project is for raising funds for field trips, band uniforms, or providing the community with a public service, citizens tend to be most cooperative. This approach fosters community pride and involvement and is one of the keys to the program's success.

The program expanded activities in early 1975 when Governor Ford gave $40,000 to the Department for Natural Resources and Environmental Protection to purchase and refurbish ten (10) used trucks secured from the Department of Transportation. Each truck was provided with a winch and fabricated loading ramp. These alternations made each truck capable of independently retrieving, loading and transporting vehicles.

During 1973 and 1974, abandoned vehicle projects were initiated and carried out in Bell, Carroll, Harlan, and Owen Counties. Approximately 6,425 vehicles were retrieved and the county sponsors earned $24,900.

The success of the pilot program gave encouragement and justification to proceed with a full-scale demonstration project. Governor Julian Carroll allocated $45,000 which together with an Environmental Protection Agency grant of $60,000 provided sufficient funds to purchase and equip twelve (12) more trucks, and hire and train crews.

PROJECT OBJECTIVES

GENERAL

The purpose of the full scale demonstration project was to improve overall solid waste management in Kentucky by recovering, for recycling, as many junked and abandoned vehicles as possible in fifteen (15) selected counties.

An additional objective was to assess the adequacy of present legislation governing junked and abandoned vehicles. If it was determined that present legislation was inadequate, then recommendations were to be made for needed changes and improvements.

Preliminary selection of project counties was based on exhibited local interest and a willingness to cooperate and play an active role in the project. Also, priority was given to those counties that would provide maximum exposure to the program.

Counties initially selected were: Adair, Anderson, Caldwell, Graves, Grayson, Hart, Jackson, Jessamine, Lawrence, Logan, Oldham, Simpson, Trigg, Trimble and Wolfe. However, final selection of participating counties varied due to practical difficulties in scheduling, weather conditions, and location to processing centers.

EXPECTED RESULTS

The project goals were to eliminate many adverse health and environmental problems, such as:

1. While eliminating an aesthetic problem, the retrieved vehicles would be recycled, thus preserving and reusing valuable natural resources;
2. Rodent harborage and breeding habitats would be eliminated;
3. Mosquito breeding habitats would be eliminated;
4. Hazardous junks and abandoned vehicle hulks would be removed thereby eliminating a safety hazard to people, especially curious children;
5. Water pollution attributed to lubricants and other leakage from the vehicles would be abated;
6. One cause of property devaluation would be removed; and
7. Through coordination with the Division of Solid Waste, garbage and trash dumps associated with abandoned vehicles would be cleaned up and closed.

PROJECT IMPLEMENTATION

EQUIPMENT AND PERSONNEL

Beginning with the grant award received from the U. S. Environmental Protection Agency on January 1, 1975, the Department initiated purchase procedures for trucks. Bids revealed that sufficient funds were available to purchase twelve (12) trucks and associated equipment instead of the original estimate of seven (7). Additional equipment purchased included winches and power take-offs for each truck. Fabrication and reinforcement of truck beds along with installation of winches and power take-offs were completed in time for project initiation in the spring.

The Department employed four (4) field supervisors to manage the project on a day-to-day basis. Because of high travel costs, a decision was made to employ local drivers who would be paid only for hours actually worked. Therefore, savings were realized when all trucks were not working and bad weather delayed project operations. A significant amount of time was required to instruct employees in the proper method of truck operation as the project progressed from county to county and new employees were hired. Another disadvantage of this approach was that truck maintenance was probably higher than if full-time, experienced drivers were employed. During the project year, a total of 168 people were provided temporary employment.

FINAL SELECTION OF PROJECT COUNTIES

Counties selected for the demonstration project differed from the initial list because local response changed. The project counties finally selected were: Allen, Calloway, Carlisle, Crittenden, Daviess, Franklin, Fulton, Hancock, Hickman, Hopkins, Magoffin, Muhlenberg, Simpson, and Union. The primary reason for the change was that some counties originally selected were not ready to proceed as equipment became available to begin work. In order to keep the project moving, counties that were best prepared to proceed were selected.

VEHICLE COLLECTION PREPARATION

The first procedure in initiating the project in a county was to make contact with the highest ranking elected officer--usually the County Judge--and explain the project to him in order to obtain maximum cooperation. This was done sufficiently in advance to allow for designation of public organizations to conduct a survey of vehicles, originate and distribute public information, develop collection procedures, and obtain legal releases for processing vehicles as required.

In some instances, only four or five (4 or 5) days were needed to locate and secure releases for 200 or 300 junked vehicles. It was required that a minimum of 200 releases be obtained prior to bringing collection equipment into a county. An enthusiastic sponsoring organization was an essential element in

the early stages of a county project. It was found that groups such as the Jaycees and the Chamber of Commerce tended to be city oriented and were difficult for rural residents to identify with. The most successful groups were county high school bands and sponsors, scouts and similar organizations that have a county-wide orientation.

Generally, the procedure utilized in locating vehicles was by using county maps and assigning sections of the county to one or two (1 or 2) individuals. Vehicles were then pinpointed on maps and landowners were contacted regarding releases. As public awareness progressed, many citizens made contact with the sponsoring groups about the location of other vehicles.

When a sponsoring group failed to get an early start in locating vehicles, the project would often bog down. In some instances counties would procrastinate in beginning preparations, perhaps feeling the Department would do this work for them. In other instances, counties would say there were no abandoned vehicles in their county. In these extreme cases, the Department's vehicle retrieval crew might take a few days to canvass the county to see if they could locate a significant number of vehicles and then provide the data to the county. Usually, the county would then proceed as a cooperating partner in the project. Prior to bringing the retrieval equipment into a county, a central, temporary vehicle storage site would have to be located. County landfills proved to be suitable storage areas in most instances.

Temporary, overnight storage of departmental vehicles was handled by county Department of Transportation garages, which usually had protection fences around them. Leaving the trucks in the field would reduce fuel costs; however, one act of vandalism could easily eliminate any savings.

VEHICLE COLLECTION

During the project period fourteen (14) counties participated in the program and a total of 5,045 junked vehicles were collected. A low number of 125 vehicles was collected in Franklin County to a high of 751 in Muhlenberg County. The average collected per county was about 360.

Following is the county-by-county total of vehicles collected and revenues received from metal dealers:

COUNTY	VEHICLES COLLECTED	REVENUES RECEIVED	AVERAGE REVENUE PER VEHICLE
Allen	275	$ 6,500	$25.63
Calloway	156	1,800	11.53
Carlisle	185	5,000	27.02
Crittenden	351	7,400	21.08
Daviess	486	8,200	16.87
Franklin	125	2,000	16.00
Fulton	340	6,100	17.94
Hancock	650	6,500	10.00
Hickman	438	8,500	19.40
Hopkins	425	14,580	34.30
Magoffin	200	3,800	19.00
Muhlenberg	751	10,300	13.71
Simpson	308	5,700	18.50
Union	355	7,900	22.25
TOTAL	5,045	$94,280	$18.68

The general procedure followed on vehicle pickup was to back the truck up to the vehicle, winch it onto the bed, secure it,

and transport it to the temporary storage site. When all of the vehicles in a county had been collected, the winning bidder would then arrange to crush and transport the vehicles to a recycling facility.

VEHICLE PROCESSING AND SALE

County sponsors were provided a list of scrap metal companies in Kentucky and surrounding states prior to the completion of the retrieval phase of the project. It was recommended that sealed bids be requested from these firms and that terms of bid arrangement should specify that the sponsor be paid a standard price per vehicle, and not per ton. It was also recommended that the terms state that the highest bid could be rejected if it was felt the price did not reflect the true market value of the vehicles. Another condition recommended was that payment be made prior to vehicle removal or at least before the selected bidder removed his or her equipment from the county.

Vehicles collected during the project were all recycled for the valuable ferrous and non-ferrous metals which they contained. When vehicles are processed for recycling, there are essentially two methods. One method is to compress the vehicle into a rectangular shape by a powerful compaction unit and ship it directly to a steel mill. This method is not an efficient means of processing a junk auto since extraneous components, such as seats and dashboards are shipped to the steel mills, thus reducing its monetary and recycling value.

The other method of processing a junk car is to shred it. A shredder is a large machine resembling a storage building. The auto is dropped into the top where it is shredded by giant hammers mounted on a rotating shaft. After the auto is shredded, the ferrous metals are separated from the non-ferrous metals usually by magnets, thus reducing the impurities and increasing the value of material shipped to a steel mill.

REVENUES AND FINANCING

Total cost to the Department for the project was $197,578 of which the Federal Grant provided $60,000. A considerable amount of this total expenditure was for equipment that will be utilized beyond the demonstration project period; therefore, the actual project cost can be considered less. Considering that the life of a vehicle used for retrieval and transporting is approximately ten (10) years, it is evident that the citizens of Kentucky will benefit from this grant for many years to come. During the project year, local sponsors received approximately $100,000 from the sale of junked cars to recycling firms. All of the benefits of this project cannot be converted into dollars and will be dealt with in the following section.

PROJECT BENEFITS

In order to adequately evaluate the benefits derived from the project, the proposed achievements should be weighed against actual results. Although the goals delineated in the grant

application were very ambitious, they were for the most part achieved.

The project benefits can be placed into four (4) major categories: (1) environmental; (2) public health and safety; (3) monetary; and (4) aesthetic.

The primary goal of the project, as stated in the grant application, was to improve the overall solid waste management program in the state by recovering as many junked automobiles as possible on a statewide basis. Besides recovering the vehicles, the Division of Special Programs naturally wanted to have all of these vehicles recycled. Another objective of the project was to review current solid waste statutes governing abandoned vehicle disposal and recommend amendments if necessary.

The major goal of the project was achieved as over 5,000 abandoned vehicles were collected and recycled. Each car was converted into approximately one (1) ton of steel.

According to the Institute of Scrap Iron and Steel, when 1,000 tons of steel are made with scrap, the energy saved is equivalent to the energy contained in 140,000 gallons of gasoline. By extending this to the 51.3 million tons of scrap metal purchased during 1974 for use in the United States, we find that the energy savings recycled from using the scrap iron was equivalent to the energy contained in nearly 7.2 billion gallons of gasoline, enough energy to power 20 million automobiles (30 miles to the gallon) nearly 11,000 miles.

The United States Environmental Protection Agency has identified six (6) additional benefits when scrap is used

instead of virgin materials: (1) 90% savings in virgin materials use (one ton of scrap conserves 1½ tons of iron ore and 1/3 ton of coal/coke); (2) 86% reduction in air pollution; (3) 76% reduction in water pollution; (4) 40% reduction in water use; (5) 97% reduction in mining waste; and (6) 105% reduction in consumer wastes generated.

Manufacturing steel from scrap metal is a good example of converting a liability into an energy saving natural resource with a minimum environmental impact.

Besides the environmental benefits, there were public health and safety benefits derived from this project. Abandoned vehicles are natural breeding grounds and habitats for insects, reptiles, and rodents. Removing abandoned vehicles also dramatically reduces the number of unpermitted garbage dumps in a county. Aside from the public health aspect, there is always a danger that children's natural curiosities will cause them to be injured while playing in an abandoned auto.

Improving water quality in an area by removing junk cars from streams improves both the environmental quality and the public health and safety in an area. With municipalities spending thousands of dollars in an effort to clean up streams, every effort should be made to eliminate potential causes of water pollution, thus decreasing the already heavy burden that is being placed on municipal water treatment plants.

The monetary benefits of this kind of project to a county are threefold: (1) it serves to raise funds for civic or school groups;

(2) it creates employment in the area; and (3) it raises the value of property where junked automobiles accumulated.

The aesthetic benefits derived from this project are difficult to quantify. How much more pleasure does an individual derive from an environment that is free from litter as opposed to one that is strewn with junked cars and trash? Few would disagree that most people prefer a clean environment and this is one of the basic principles on which the abandoned vehicle removal program is based.

Another intangible benefit derived from the project is the enjoyment and cultural enrichment that resulted from revenues that were raised; that enabled, for instance, a girl scout troop taking a field trip to Philadelphia or Jaycees sponsoring toys-for-tots and birthday parties for handicapped children. High school bands have proved to be one of the best sponsors for the program and in return they are able to take trips or to buy new band uniforms.

In the event that excess funds exist, they are often expended for a community beautification project or an environmentally related project, such as films promoting environmental awareness that could be shown in schools or to community action groups.

CONCLUSION

The ultimate success or value of a project must be judged in terms of the overall benefits derived from the project versus

its cost. Many of the benefits derived from this project cannot be given monetary value. It is clear, however, that nearly $100,000 was made by sponsors during the grant period. Nearly $200,000 was spent on the program from January, 1975, through December, 1975, (the grant period). Twelve (12) trucks were bought and retooled with these funds. The estimated life of these trucks is ten (10) years. So, clearly, Kentuckians will be benefiting from the grant for many years.

FUTURE PROGRAM NEEDS

In the future, the Department intends to operate the program in a manner similar to the past. One of the minor changes planned is to hire drivers on a permanent basis. By having permanent drivers, the life expectancy of the retrieval vehicles should be extended. The Department does not anticipate any major equipment needs in the future.

LEGISLATIVE RECOMMENDATIONS

Kentucky has an adequate junk car law, KRS 177.905-990. If there has been deficiency in the past, it has been in the area of enforcement; however, the Kentucky Department of Transportation which is charged with enforcing this law has recently initiated an ambitious, statewide enforcement program. The statewide priorities that have been established are to begin with federal highways, then work down to federal-state roads, then to state and finally to county roads. The Kentucky Law states

that if five (5) inoperable cars are within 200 feet of the center line of the highway, a screen must be erected. Those found to be in noncompliance must submit a compliance schedule or be fined.

In view of the recent increased effort by the state, the Division of Special Programs is being required by the state to post a sign in front of their temporary storage site within a county, identifying what it is and giving an estimated time when the cars will be removed.

There are several other legislative alternates that need to be considered in order to improve the national recycling effort. One major problem is the inconsistency in the freight charges that scrap metal haulers must pay as opposed to those shipping iron ore. The Institute of Scrap Iron and Steel, Inc., estimates that it costs almost three (3) times as much to haul scrap iron as it does the virgin material. This naturally has a dramatic effect on the supply and demand quotients of these two commodities.

The federal government is in effect encouraging the unnecessary use of some of our natural resources and thus encouraging the growth of abandoned vehicle graveyards. In terms of reducing and rechanneling the stream of solid waste, it is the federal government which should set the example. Many of the solutions to the critical problem of reducing and rechanneling the stream of solid waste are regional or national and difficult or impossible for a city or state to deal with in a comprehensive fashion.

PROJECT CONTINUATION (results from January - June, 1976)

During the first six (6) months of this year, 2,200 vehicles were retrieved and sold to scrap metal firms for approximately $53,000. Although the Department has not substantially altered the abandoned auto retrieval program, there are plans to study and consider the possibility of collecting valuable white goods, such as the ferrous metals found in kitchen appliances. There are several problems related to physically removing these appliances from creeks, ravines, etc., which will require some study and experimentation. There is definitely a need to address this problem, especially in Eastern Kentucky where there are a limited number of sanitary landfills in which to dispose of these appliances.

This program could be handled as follows: initially, the Division would allow the local sponsors to advertise their willingness to come to a person's home and pick up the old appliances. If there is a favorable response, the possibility exists for retrieving these appliances from areas where they present a real environmental or public health and safety hazard. At the moment, this idea is still in the planning stages, although we feel there is a real possibility for its implementation.

APPENDIX A

PROJECT DEVELOPMENT IN THREE-COUNTY AREA

The chart on the following page visually delineates the timing of various phases in the development of this project and illustrates how important timing and momentum are to the success of the program. Listed below are the phases referred to on the chart.

(1) Departmental official makes initial contact with highest ranking elected official in the county;

(2) Initial contact with county sponsor (after designation);

(3) Sponsor orientation session; location of temporary storage areas for the cars;

(4) Publicity for the project should be initiated;

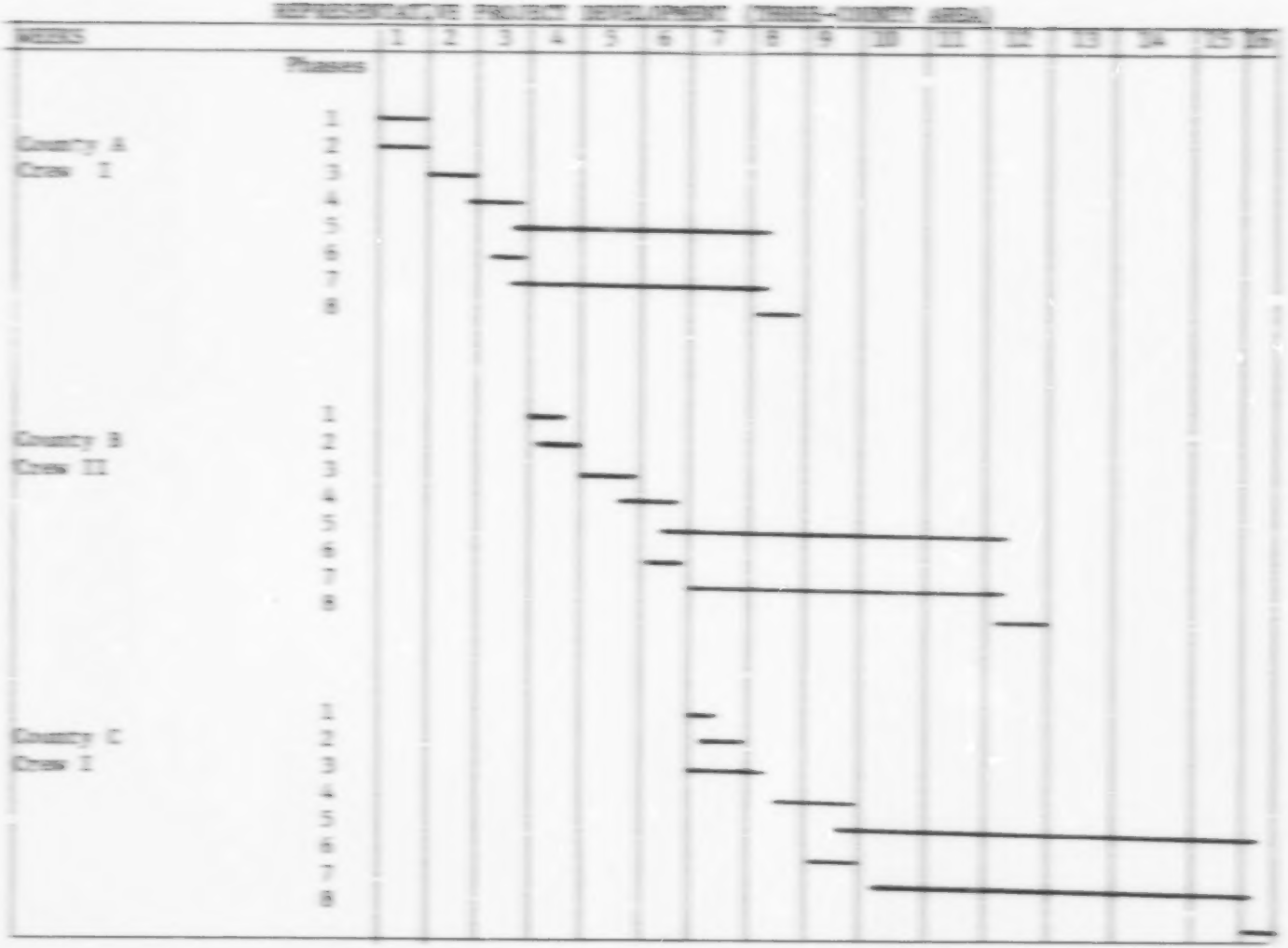
(5) Canvassing county; identifying abandoned autos and obtaining their legal release;

(6) Training period for local truck drivers;

(7) Retrieval process begins after minimum number of releases have been secured; and

(8) Portable crusher is brought into county (usually after the retrieval process is complete).

Naturally this program does not always run this smoothly. There is a potential for delay throughout the entire process. It is the responsibility of the project manager to anticipate and deal with these situations as they may arise.


WEEKS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Phases
County A
Crew I
1 2 3 4 5 6 7 8
County B
Crew II
1 2 3 4 5 6 7 8
County C
Crew I
1 2 3 4 5 6 7 8

APPENDIX B

RELEASE OF LIABILITY

In CONSIDERATION OF THE REMOVAL of a _____
year model

_____ _____ _____
make *body style* *serial number*

(Body, Chassis, with or without motor), I, _____ release the State of Kentucky and/or their agents from all liability which may be caused from any person who may at any time claim ownership or a lien of any nature matured or not matured upon said vehicle or any accessories thereon including the engine.

This release encompasses any and all claims.

Witness my signature this day of _____, 19___,

at _____, _____, Kentucky.
city *county*

Witness:

_____ _____

_____ _____

Exact location of car _____

_____

_____

_____

_____

Is car towable? _____

Does car have a front and/or rear axle on it? _____

Does car have front and/or rear wheels and tires on it? _____

APPENDIX C

FINANCIAL REPORT

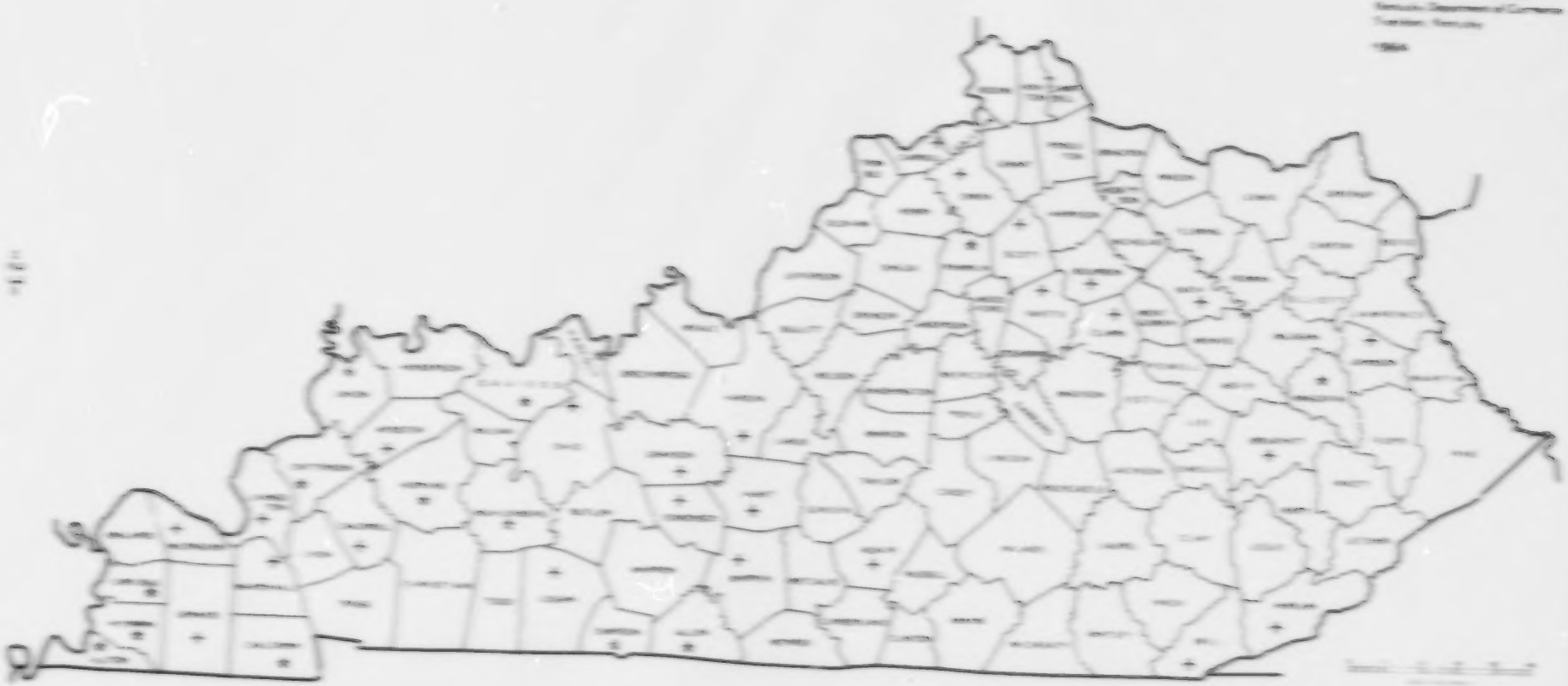
BUDGET

A.	Personnel (environmental supervisor, equipment operators)	$75,498.
B.	Fringe Benefits (FICA, insurance, retirement)	7,788.
C.	Travel (meals, lodging, mileage)	-0-
D.	Equipment (trucks, winches, power take-off, truck bed fabrication)	78,416.
	TOTAL	$161,702.

EXPENDITURES

A.	Personnel	$ 75,498.
B.	Fringe Benefits	7,788.
C.	Equipment	78,416.
	SUB-TOTAL (Program Expenditures)	$161,702.
*	SUB-TOTAL (Non-Program Expenditures)	35,876.
	TOTAL EXPENDITURES	$197,578.

* Breakdown of Non-Program Expenses include: travel, fuel, maintenance, and part-time labor, which were not reimbursed through grant.



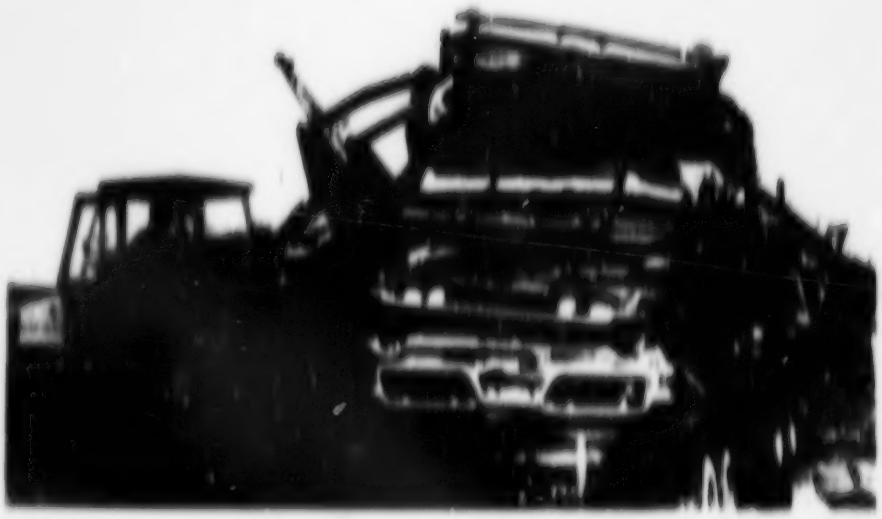
* Counties cleaned up during grant period

+ Other counties cleaned up

JUNK CARS LOADED WITH WINCH AND INCLINED LOADING RAMP.

THIS VEHICLE IS ALMOST LOADED. WINCH IS MOUNTED BEHIND TRUCK CAB. CHAIN WITH LOAD BINDER ARE USED TO SECURE VEHICLE AFTER LOADING. CAB PROTECTOR AND LOADING RAMP EASILY SEEN ALSO FROM THIS VIEW.

ANOTHER VEHICLE BEING PLACED IN PORTABLE CRUSHER BY FORK-LIFT WITH ONE CRUSHED VEHICLE REMAINING.



CRUSHED VEHICLES, APPROXIMATELY 30, BEING LOADED FOR TRIP TO METAL SHREDDER AND FURTHER PROCESSING-RECYCLING. U.S. STEEL PRODUCTION CONTAINS 55% SCRAP AT PRESENT.

REFERENCES

1. "Base Data Regarding Recycling Solid Waste: Sixteen Southeastern Kentucky Counties", prepared by Parrot, Ely, and Hurt Consultant Engineers, Lexington, Kentucky; under a grant from the Kentucky Department of Health, Appalachian Environmental Health Demonstration Project and financed by the Appalachian Regional Commission, February, 1973.

2. "Reclamation, Conservation, Beautification", The Institute of Scrap Iron and Steel, Inc.

Acknowledgments

There are several organizations that were instrumental in the success of this project. On the local level, numerous organizations should be recognized. The members of the Kentucky Association of County Judges have always cooperated with Departmental personnel in all phases of this project.

In addition, the following organizations served as county sponsors for this project:

The Allen County High School Band,
The Calloway County 4-H Club,
The Crittenden County 4-H Club,
The Daviess County High School Band,
The Bluegrass Area Development District for the Senior Citizens Project in Franklin County,
The Hancock County High School Band,
The Girl Scouts in Hickman County,
The Kiwanis Club in Hopkins County,
The Future Farmers of America in Magoffin County,
The Senior Class of Hughes-Kirk High School,
The Franklin-Simpson High School Band, and
The Union County High School Band.

On the state level, assistance from personnel within the Division of Solid Waste should be acknowledged in the development phase of this project. The staff of the Office of Planning and Research is primarily responsible for organizing and writing this demonstration manual.

Mr. Elmer Cleveland, grant project officer in the Solid Waste Management Program in the Environmental Protection Agency, played a major role in developing and managing this project. On several occasions he came to Kentucky and offered timely advice. Mr. William Holland, also in the Solid Waste Management Program, played a role in securing this grant for Kentucky while he was assigned to the Division of Solid Waste.

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